Dear Dr. Yi He,

I would like to express my sincere gratitude for the time and effort you dedicated to reviewing our manuscript. Your specific recommendations have been incredibly helpful in improving the quality of our work, and we truly appreciate your support. All the comments have been considered and a point-by-point response has been provided below.

The point-by-point response is formatted as follows:

- Your comments are shown in blue
- Our responses are shown in black
- The changes in the manuscript are shown in red. The line numbers indicated in this response are those in the "Revised Manuscript with no changes marked" document
- The unchanged parts of the manuscript are shown in black

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1. Line 164: “2 Methodology and method”: change it to “2 Methodology”

**Response**: Thank you for your helpful suggestion. We have changed the section title as per your advice (Lines 164).

**Revised Manuscript LINES 164:**

2 Methodology

2. Line 166-170: “The Xin'anjiang model, conceptualized by Zhao (1992), is a distinguished hydrological model, primarily based on a saturation excess mechanism. Renowned for its straightforward structure and explicit parameter definitions, this model excels in simulating humid catchments, making it a popular tool for flood forecasting in in China. To account for spatial variability in rainfall distribution and surface characteristics, the model typically segments a catchment into several sub-basins. These sub-basins act as computational units for runoff generation and routing.”

“distinguished hydrological model”: Inappropriate in academic writing. If you want to highlight a model’s respected status, you could describe it as “widely recognised,” “commonly used,” or “well-regarded in hydrological research.” This phrasing is more objective, in line with academic standards.

“To account for spatial variability in rainfall distribution and surface characteristics, the model typically segments a catchment into several sub-basins.”: change to “To account for spatial variability, the model typically divides a catchment into sub-catchments.”

Please also change sub-basins to sub-catchments throughout the manuscript.

**Response**: Thank you for your helpful suggestion. We have revised the wording of the relevant sentences according to your suggestions (Lines 166-170). In addition, we have replaced sub-basin with sub-catchment and basin with catchment throughout the text to maintain consistency in terminology.

**Revised Manuscript LINES 166-170:**

The Xin'anjiang model, conceptualized by Zhao (1992), is a commonly used hydrological model, primarily based on a saturation excess mechanism. Renowned for its straightforward structure and explicit parameter definitions, this model excels in simulating humid catchments, making it a popular tool for flood forecasting in in China. To account for spatial variability, the model typically divides a catchment into sub-catchments. These sub-catchments act as computational units for runoff generation and routing.

3. Line 171: The Xin'anjiang model demands relatively straightforward driving data

Change to "The Xin'anjiang model demands relatively simple forcing data"

**Response**: Thank you for your helpful suggestion. We have revised this sentence according to your advice (Lines 171-172).

**Revised Manuscript LINES 171-172:**

The Xin'anjiang model demands relatively simple forcing data, and key inputs include the areal mean rainfall depth (P) and pan evaporation (EM) for each sub-catchment.

4. Line 348: "Study areas and data"

Change to "Study area and data"

**Response**: Thank you for your helpful suggestion. We have changed the section title as per your advice (Lines 348).

**Revised Manuscript LINES 348:**

3 Study area and data

5. Line 350: "with elevations ranging from 42 to 1,396 meters"

Meters above sea level? Need to specify the reference.

**Response**: Thank you for your helpful suggestion. We have added an explanation in the text that the elevation is referenced against sea level (Lines 350-351).

**Revised Manuscript LINES 350-351:**

It covers an area of approximately 8,033 km², with elevations ranging from 42 to 1,396 meters above sea level.

6. Line 372-373: please provide the recommended warm-up length

**Response**: Thank you for your helpful suggestion. We recommend a warm-up period of at least 3 months, and have added to the manuscript (Lines 371-377).

**Revised Manuscript LINES 371-377:**

Consequently, a daily simulation must be performed prior the hourly simulation, and we recommend that this warming-up (spin-up) be at least three months long. This period enables the soil moisture simulated daily, driven by observed hydrometeorological data, to gradually approaches actual soil moisture (Kim et al., 2018). The influence of initial soil moisture on the daily simulation becomes minimal by the end of

warming-up period, allowing soil moisture for daily simulation to be used as initial conditions for hourly simulation (Yao et al., 2012). The daily simulation in this study began on February 10, 2014. Testing showed that even in extreme cases where the initial soil moisture in the daily simulation is set to zero or fully saturated, there is almost no impact on the flood simulation results.

7. Lines 461, 487: two sub-headings should be removed. It is clear enough to tell from the text below what the following paragraph is about. The same applies to the sub-headings used in Section 5.2.2.

**Response**: Thank you for your helpful suggestion. We have removed the subheadings under Sections 5.1.3 and 5.2.2.

8. Figures 11, 12: fonts in the legends need to be enlarged. They cannot be read clearly at the 100% scale.

**Response**: Thank you for your helpful suggestion. We have increased the font size of the legends in Figures 11 to 13. Additionally, we have optimized the layout of Figures 12 and 13 to improve readability.

**Revised Manuscript Figure 11：**

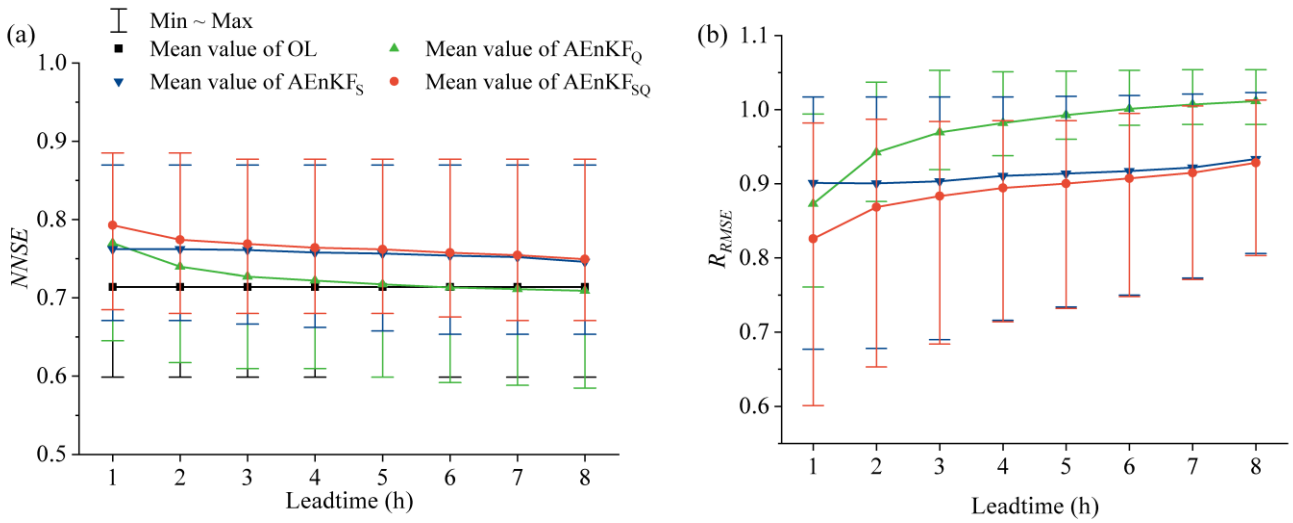


**Fig. 11. The accuracy of forecasted discharge under different lead time. (a) NNSE, (b) $R_{RMSE}$.**

**Revised Manuscript Figure 12:**

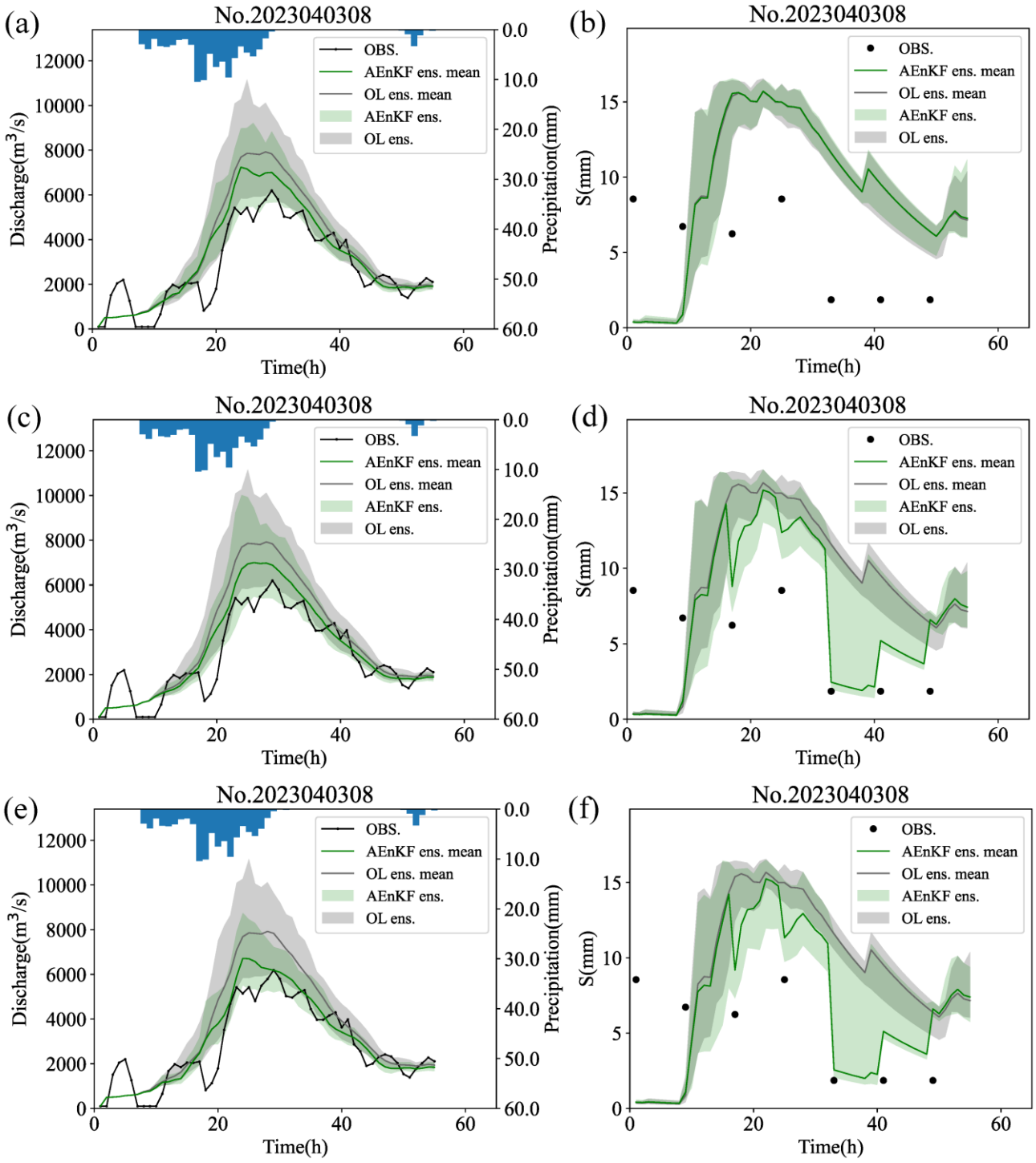


**Fig. 12. Hydrograph during flood event labeled No.2023040308. (a-b) AEnKF$_Q$ Scheme, (c-d) AEnKF$_S$ Scheme, (e-f) AEnKF$_{SQ}$ Scheme. The left panel shows the discharge at the catchment outlet, and the right panel displays the free water storage in sub-catchment 1.**

**Revised Manuscript Figure 13:**

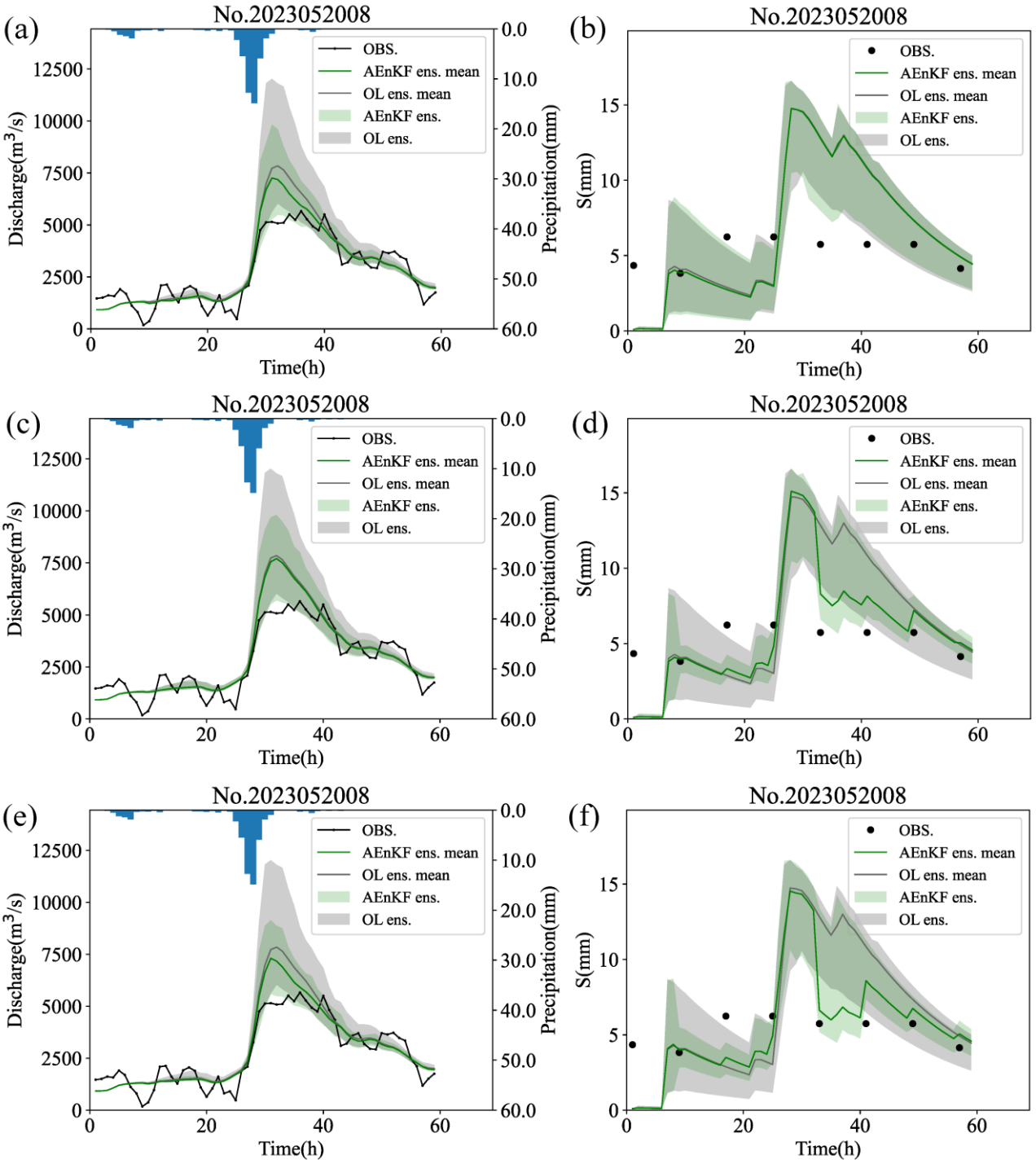


**Fig. 13. Hydrograph during flood event labeled No.2023052008. (a-b) AEnKF$_Q$ Scheme, (c-d) AEnKF$_S$ Scheme, (e-f) AEnKF$_{SQ}$ Scheme. The left panel shows the discharge at the catchment outlet, and the right panel displays the free water storage in sub-catchment 1.**